

## Appendix 3 – LCES Analysis Summary

<b>Lookouts, Communications, Escape Routes, Safety Zones (LCES) Analysis</b>			
Critical components associated with LCES safety system application - Engine 57			
<b>E = Established</b>	<b>NE = Not established</b>	<b>IP = In place</b>	<b>NP = Not in place</b>
<b>DW = Doublewide</b>	<b>TH = Tile House</b>	<b>LO = Lookout</b>	
<b>LOOKOUTS</b>		<b>Remarks</b>	
<b>Trained/Qualified</b> – Experienced with authority to take action?	IP		Engine 57 Captain was trained, qualified, and experienced to serve as a tactical lookout. There were no strategic lookouts assigned at other locations with a big picture view of the operation.
<b>Equipped</b> - Map, weather kit, binoculars?	IP		Local area map (topo w/roads) may not have been used or available.
<b>Location</b> – Good vantage point in safe spot?	IP		Entrapment/burnover confirms that location was not safe. LO had to remain in position at lip/edge of chute to have a complete/clear view into the bottom of the drainage below the structure.
<b>Escape Routes/Safety Zones</b> – Knowledge of locations?	IP		LO location was not survivable given the fire environment and conditions.
<b>Adjoining forces</b> – Knowledge of locations?	IP		Engine 57 was aware of the other engine's locations at the DW and TH, and did provide them with some information on the fire activity and operations.
<b>COMMUNICATIONS</b>		<b>Remarks</b>	
<b>Effective (face-to-face) briefings:</b> <ul style="list-style-type: none"> <li>▪ LCES?</li> <li>▪ Fire Environment?</li> <li>▪ Hazards/Risks?</li> <li>▪ Strategy/tactics?</li> </ul>	IP		Branch II had a face-to-face meeting with Engine 57 Captain at the accident site just prior to the burnover.
<b>Radios</b> – Established communications with known frequencies?	IP		Engine 57 used a Forest Service radio tactical frequency not assigned to the fire to maintain communications with other FS engines at the DW and TH.
<b>Adjoining forces</b> – Informed of LO location/role?	IP		Engine 57 was aware of location of the fire engines located at the TH and DW.
<b>Status checks</b> – Updates/warnings/trigger points?	IP		Available trigger points were not effectively used.
<b>Clear</b> – radio discipline, chain of command, important info?	IP		Engine 57 used a Forest Service radio tactical frequency not assigned to the fire.

<b>ESCAPE ROUTES</b>			<b>Remarks:</b>
<b>Planned/Scouted?</b>	NP		Engine 57 did not scout out alternative escape routes in the area of refuge at the DW. Both roads up and out to Twin Pines Road were compromised by fire early on.
<b>Flagged/ID?</b>	NE		
<b>Timed/distance?</b>	NE		The distance to the DW area of refuge was approximately 1,500 feet from the accident site.
<b>Barriers?</b>	NE		Smoke and heat at the DW area of refuge once the burnout started.
<b>More than one?</b>	NE		
<b>Traffic control?</b>	NE		Both access roads/routes were cut off by fire.
<b>Monitored?</b>	NE		No strategic command oversight of operation.
<b>SAFETY ZONES</b>			<b>Remarks:</b>
<b>Clean burn, natural, developed vehicle?</b>	NP		Engine 57 Captain communicated to others on the radio that he felt secure at his location. Location/structure included heavy fuels and a notable accumulation of flammable property items on the ground, including several out buildings and vehicles.
<b>Planned/Scouted?</b>	NP		Secondary safety zone at DW was not scouted.
<b>Large enough?</b> – Factors: people, equipment, fire environment	NP		Primary safety zone was not large enough and a potential identified secondary safety zone at the DW required precision burnout/holding to serve as a marginal area of refuge.
<b>Terrain</b> - Saddles, chutes, canyons avoided?	NP		Accident site is located at the top of a long, steep drainage (chute).
<b>Location</b> - known by all?	NP		
<b>Hazards ID?</b> – Snags, power lines, hazmat?	NP		The round shape of the Octagon House contributed to a fire eddy effect and negated the opportunity for firefighters to use the house as a refuge.